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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/344,190	06/24/1999	KENNETH SCOTT KUMP	15-XZ-4971	8765

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EXAMINER

CHOOBIN, BARRY

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 07/15/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/344,190

Applicant(s)

KUMP, KENNETH SCOTT

Examiner

Barry Choobin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12 and 15-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,15-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1 and 11 have been considered but are not persuasive.

As to claim 1, Applicant argues that prior art fails to teach or suggest "dividing a medical image to at least two bands".

Examinet disagrees. Ergun et al disclose a 4 by 4 block of pixels in Fig. 19 and column 10, lines 21 – 26, and X and y direction directions corresponds to vertical and horizontal directions.

As to claim 11, Applicant argues that prior art fails to teach or suggest identifying clinical and non-clinical region within a digital medical image (clinical region corresponds to region of interest in Ergun et al which is disclosed in Fig.11 and the rest of the image of no interest is considered as non-clinical region).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 3 -12 and 15 - 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Ergun et al (U.S. Patent 6,298,109).

As to claim 1, Ergun et al disclose a method for determining a dynamic range of a digital medical image for a medical imaging system, the digital medical image containing a clinical region, comprising:
dividing a digital medical image into at least two bands of predetermined width (refer for example to Fig .19);

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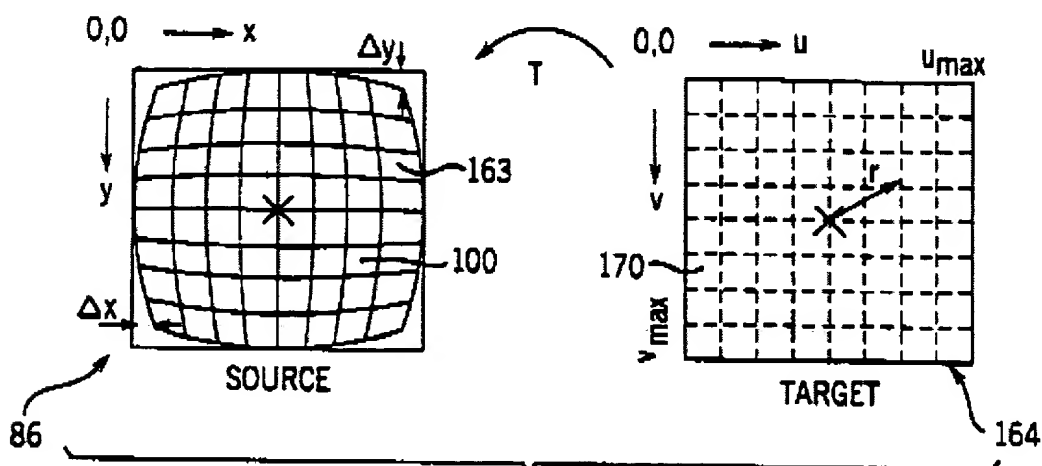
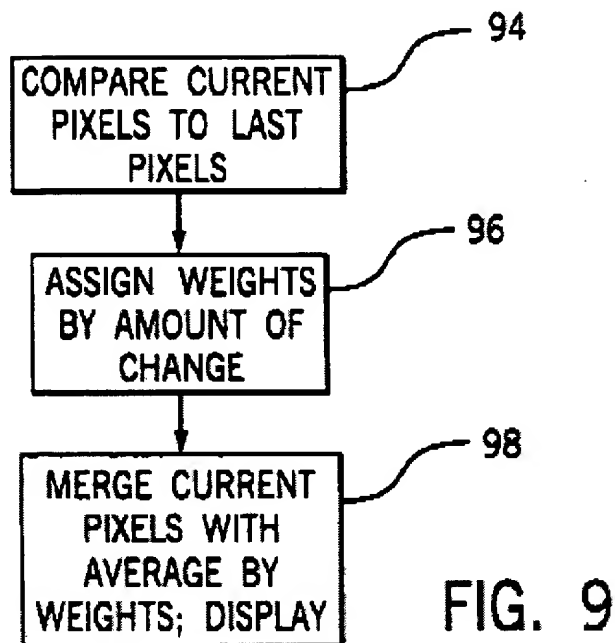


FIG. 19

determining whether the digital medical image within said at least two bands includes at least one non-clinical region (column 2, lines 43-46 wherein control of the exposure of the imaged object based only on the portion of the image attenuated by the object is provided corresponding to non clinical image region); and calculating a dynamic range for a clinical region (column 4, lines 40-45, Fig.6 and column 7, lines 41-66 wherein the CCD 84 provides a complete set of radiation data for an entire image 86 (a frame) periodically once every "frame interval" so that real time image of a patient placed within X-ray beam 80 may be obtained, corresponding to calculating a dynamic region in this portion of claim).

As to claim 3, Ergun et al disclose the digital medical image is divided into one horizontal and vertical bands (column 11, lines 13-32 and Fig. 19).

As to claim 4, Ergun et al disclose differentiating said digital medical image, said determining step calculating a position of the non clinical region based, on a result of said differentiation (column 11, lines 33-53 and Fig.9 and Fig.11).



As to claim 5, Ergun et al disclose calculating at least one threshold based on a dynamic range of the digital medical image, said at least one threshold being used to identify at least one of maximum and minimum values for the non-clinical region (column 11, lines 53-60 and column 12, line 59- column 13, line 3).

As to claim 6, Ergun et al disclose determining step discriminates at least one of histogram maximum and minimum values for a non-clinical region based on at least one predetermined threshold (column 12, line 59 through column 13, line 3).

As to claims 7 and 8, Ergun et al disclose masking non-clinical regions based on at least one of gray scale maximum and minimum values for the non clinical region (refer for example to column 16, lines 28-40 wherein the image 208 is then used to derive a scatter map. Referring to FIG. 23, generally the amount of scatter at a given

point will be a function of how many x-ray photons are received at points adjacent to the given point. For example, comparing the image 208 to a theoretical scatterless image 228 generally in an attenuated region 230 of the image 208 (e.g., under the spine 200), scatter will increase the apparent value in the image 208 as a result of radiation from nearby low attenuation regions scattering into the high attenuation region 230. Conversely the apparent value at a low attenuation region 232 will be decreased because of the scatter into the high 5 attenuation region .).

As to claim 9, Ergun et al disclose generating a histogram of the digital medical image, said masking step masking gray scale levels from the histogram that exceed predetermined upper and lower thresholds (column 11, lines 33-53).

As to claim 11, Ergun et al disclose a medical diagnostic imaging system for controlling a dynamic range of a digital medical image to be displayed, comprising: a segmentation module identifying clinical and non-clinical region within a digital medical image, said non-clinical regions comprising at least a collimated region (refer for example to column 16, lines 28-40 wherein the image 208 is then used to derive a scatter map. Referring to FIG. 23, generally the amount of scatter at a given point will be a function of how many x-ray photons are received at points adjacent to the given point. For example, comparing the image 208 to a theoretical scatterless image 228 generally in an attenuated region 230 of the image 208 (e.g., under the spine 200), scatter will increase the apparent value in the image 208 as a result of radiation from nearby low attenuation regions scattering into the high attenuation region 230. Conversely the apparent value at a low attenuation region 232 will be decreased

because of the scatter into the high 5 attenuation region .); and a dynamic range module determining a dynamic range of a clinical region of the digital medical image once the non-clinical region is segmented (see claim 1)).

As to claim 15, Ergun et al disclose segmentation module identifies non-clinical regions based on variations in gray scale levels of the digital medical image (column 11, lines 13-32 and Fig.13).

As to claims 17 and 18, Ergun et al disclose the segmentation module discriminates the non-clinical region based on at least one gray scale threshold value (column 11, lines 53-60 wherein thresholding process or subtraction disclosed in reference to background pixels).

Claims 10,12,16,19,20-27 are similarly analyzed and rejected.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry Choobin whose telephone number is 703-306-5787. The examiner can normally be reached on M-F 7:30 AM to 18:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 703-308-5246. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Barry Choobin
July 9, 2003


BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
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